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# 7646

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Fuzing System for XSAM-N-4, Guided Missile Dove; Testing of

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PART A

SYNOPSIS

1. The "Dove" is an air-to-ground missile with short wings, having no self propulsion. It is approximately 24 inches in diameter by 5 feet in length, with air scoops in the nose and stabilizing fins on the tail section to control the flight. The Naval Ordnance Laboratory is developing the tail fuzing system for the warhead.

2. The object of these preliminary tests was to devise a satisfactory method of conducting plate impact tests of the XB-44A fuze when fired in simulated missiles from the Naval Proving Ground's 500 foot rocket launcher.

3. It was concluded that:

a. Satisfactory terminal velocities and impact conditions can be obtained by the use of rocket motors to propel the XB-44A fuze from the Naval Proving Ground's 500 foot launcher while it is installed in a 250 lb. G.P. bomb AN-M57-A1.

b. The XB-44A fuze, as tested during this program, did not function as a result of shock or vibration while in motion on the launcher and therefore was considered "launcher safe".

c. One-half inch STS plate appeared to provide the minimum retardation which would cause the XB-44A fuzes to function when tested under the impact conditions of this program. Of the seven fuzes tested:

- (1) Only two functioned in flight with a 250 ft. delay
- (2) One functioned after a heavy secondary impact
- (3) Two functioned in the recovery sandpile
- (4) Two did not function.

d. The propulsion carriage can be separated from the bomb before target impact by the use of a 3V25 motor Mk 7 secured in the carriage to function as a "retro-motor", if a minimum of 150 ft. is provided between the launcher muzzle and target.

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PART B

INTRODUCTION

1. AUTHORITY:

Reference (a) authorized the Naval Proving Ground to perform such tests of the tail fuzing system for the XSAM-N-4, Guided Missile Dove, as might be requested by the Naval Ordnance Laboratory. Reference (b) established Task Assignment NPG-04-Re2b-33, later superseded by Reference (e) Task Assignment NPG-Re2b-34-1-52, to provide the necessary funds. References (c) and (d) outlined the test requirements.

2. REFERENCES:

- a. BUORD ltr NP9(Re2b-286 2)FLY:ss of 4 Apr 1949
- b. BUORD ltr NP30(Re2b)JWG:ss of 25 May 1950
- c. NOL ltr NP51/S71-S(3-615)TF:HLD Ser 01641 of 19 Dec 1950
- d. NOL ltr NP/NOL/X1-1(497)TF:HLD Ser 0802 of 4 May 1951
- e. BUORD Conf ltr NP9 Re2b-DB LaP:bjn Ser 23946 of 4 Aug 1951

3. BACKGROUND:

The "Dove" is an air-to-ground missile with short wings, having no self propulsion. It is approximately 24 inches in diameter by 5 feet in length, with air scoops in the nose and stabilizing fins on the tail section to control the flight. The Naval Ordnance Laboratory is developing the tail fuzing system for the warhead.

4. OBJECT OF TEST:

The object of these preliminary tests was to devise a satisfactory method of conducting plate impact tests of the XB-44A fuze when fired in simulated missiles from the Naval Proving Ground's 500 ft. rocket launcher.

5. PERIOD OF TEST:

- |                                     |               |
|-------------------------------------|---------------|
| a. Date Project Letter              | 4 May 1951    |
| b. Date Necessary Material Received | 25 April 1951 |
| c. Date Commenced Test              | 10 May 1951   |
| d. Test Completed                   | 29 May 1951   |

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6. REPRESENTATIVES PRESENT:

H. L. Davis  
R. Happick

Naval Ordnance Laboratory  
Naval Ordnance Laboratory

PART C

DETAILS OF TEST

7. DESCRIPTION OF ITEM UNDER TEST:

a. The XB-44A construction and overall appearance is shown in Figures 1 and 2. It is a vane arming fuze with dual primers detonated upon impact by means of firing pins. A delay train provides for functioning after penetration of the target.

8. DESCRIPTION OF TEST EQUIPMENT:

Test Vehicles: Modified 250# G.P. Bombs AN-M57-A1 inert loaded

Launcher: Naval Proving Ground's 500 ft.

Target: 1/2" STS plate

Propulsion: Three 540 HVAR motors in carriage

Fuze Arming: 100# compressed air supply

Cameras: Bowen and Mitchell, operated at 90 and 100 frames/sec. respectively.

9. PROCEDURE:

a. All fuzes were tested in modified 250# G.P. bombs. The fuzes were inserted in the tails of the bombs and protected by a heavy steel tube threaded to the bomb. A 1" x 2" hole was cut through the tube opposite the arming vane of the fuze to permit the insertion of an air hose used for remote arming prior to firing. Propulsion of the bombs was accomplished by the use of three 540 HVAR motors assembled in a special carriage as shown in Figure 3, and ignited simultaneously. Fuze functioning was indicated by the ignition of a cross axial, 350 gm. black powder smoke

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puff in a tube 8-1/2" long by 1" diameter, situated immediately forward of the fuze booster. The 1/2" STS target plates were set up 50 ft. from the muzzle of the launcher on initial rounds and 15 ft. on later shots,

b. The arming vane was secured to the fuze arming shaft at the launching site by means of a special coupling. After assembling the three 540 HVAR motors in their carriage the propulsion vehicle and bomb were placed in the launcher, in contact with each other. The smoke puff tube was inserted in the bomb and taped in place. A 1" diameter air hose, leading from a gasoline powered, field type compressor (capable of supplying 100 lb./sq.in. air pressure), was inserted in the slot in the protective tube enclosing the arming vane. A 50 lb./sq.in. stream of air, controlled from a remote location, was then directed against the vane while all personnel were under shelter. Before firing the arming stem was checked to see that it had withdrawn sufficiently to permit arming. A Bowen camera and two Mitchell cameras were used to record the flight of the round. Velocities were measured during the last 20 ft. of travel on the launcher. Rounds were recovered in a large sandpile.

10. RESULTS AND DISCUSSION:

a. Appendix (A) contains detailed records of the plate impacts. Appendix (B), Figure 4, is an excerpt from the Bowen films taken of round 7. Following is a brief summary of the results obtained - all rounds fired against 1/2" STS plate at 0° obliquity:

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Rd. No.	Date	Impact No.	Impact Velocity ft./sec.	Fuze No.	Remarks	Results
1	5-10-51	39028	888	117	Questionable whether fuze was fully armed when round was fired.	No evidence of functioning in flight-when recovered fuze had functioned-smoke puff fired.
2	5-14-51	38991	883	118		"
3	5-16-51	38993	859	119	Target 15' from muzzle starting with this shot-50' on first two rounds.	No evidence of functioning in flight. Some black powder still in tube when recovered, no evidence of functioning.
4	5-16-51	38994	903	120		No evidence of functioning in flight. All black powder still in tube when recovered.
5	5-21-51	39020	643	121	Only two motors fired.	No functioning in flight-after going through target round glanced off wedge in butt with fuze functioning about 60 ft. behind butt.
6	5-21-51	39021	893	122		Fuze functioned approx. 250 ft. behind target.
7	5-22-51	39022	916	123		Fuze functioned approx. 245 ft. behind target.

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Fusing System for XSAM-N-4, Guided Missile Dove; Testing of  
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b. (1) While the propulsion method described above was satisfactory for the purpose of this test (it provided a combination of low acceleration and high striking velocity) it had one undesirable feature as far as future test programs were concerned. The propulsion motors remained in contact with the bomb all the way to the target. The sensitivity of the fuze upon impact, when installed in a 250 lb. G.P. bomb, was therefore an unknown quantity since the entire mass of the propulsion vehicle was helping to force the bomb through the target. Even though the bomb is not the ultimate vehicle for this fuze, it is obviously desirable to have the propulsion carriage separated from the bomb before impact to prevent damage to the fuze.

(2) Several separation methods were considered but the use of a retro-motor in the carriage appeared to be the quickest solution, involving a minimum of test firing. A 3W25 motor Mk 7 was installed in the upper part of the carriage directed oppositely to the three 5W0 motors. A set of contacts was provided to ignite the 3W25 motor 100 feet before reaching the muzzle of the launcher. Effective separation of the bomb and propulsion carriage in flight, Figure 5, approximately 150 ft. beyond the muzzle of the launcher, was thus obtained.

(3) The 5W0 HVAR motors used for propulsion (the only type available that would produce the desired striking velocity) burn for approximately 700 ft. The only launcher which will accommodate a 250 lb. G.P. bomb at the Naval Proving Ground is 500 ft. in length. Consequently the motors still have a considerable amount of thrust at the muzzle of the launcher and can not be effectively separated from the bomb for some distance beyond this point--a minimum of 150 ft. Erection of a target 150 ft., or further, beyond the muzzle precludes the possibility of bomb recovery when sufficient range for observation of fuze functioning is allowed behind the target, due to the short distance between the launcher and the edge of the river (550 ft.). The 1/4 second fuze delay after plate impact will result in functioning almost at the edge of the river and allow no room for a recovery sandpile. Therefore in future tests it will be necessary to sacrifice either the recovery of the bomb or the separation of the bomb and propulsion carriage.



Fuzing System for XSAM-N-4, Guided Missile Dove; Testing of  
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PART D

CONCLUSIONS

11. It was concluded that:

a. Satisfactory terminal velocities and impact conditions can be obtained by the use of rocket motors to propel the XB-44A fuze from the Naval Proving Ground's 500 ft. launcher while it is installed in a 250 lb. G.P. bomb AN-M57-A1.

b. The XB-44A fuze, as tested during this program, did not function as a result of shock or vibration while in motion on the launcher and therefore was considered "launcher safe".

c. One-half inch STS plate appeared to provide the minimum retardation which would cause the XB-44A fuzes to function when tested under the impact conditions of this program. Of the seven fuzes tested:

- (1) Only two functioned in flight with a 250 ft. delay
- (2) One functioned after a heavy secondary impact
- (3) Two functioned in the recovery sandpile
- (4) Two did not function

d. The propulsion carriage can be separated from the bomb before target impact by the use of a 3V25 motor Mk 7 secured in the carriage to function as a "retro-motor", if a minimum of 150 ft. is provided between the launcher muzzle and target.

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Fuzing System for XSAM-N-4, Guided Missile Dove; Testing of  
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The tests upon which this report is based were conducted by:  
F. W. KASDORF, Firing Director, Rocket Battery,  
Terminal Ballistics Department

This report was prepared by:  
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Terminal Ballistics Department

This report was reviewed by:  
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Terminal Ballistics Department  
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Terminal Ballistics Batteries Officer,  
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APPROVED: IRVING T. DUKE  
Rear Admiral, USN  
Commander, Naval Proving Ground

  
C. T. MAURO  
Captain, USN  
Ordnance Officer  
By direction

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**NPG REPORT NO. 933**

**U. S. NAVAL PROVING GROUND  
DAHLGREN, VIRGINIA**

**Fifth Partial Report**

**on**

**Combat Air Operations Guided Missile Fuzes;  
Research, Development, Tests and Reports of**

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**Second Partial Report**

**on**

**Fuzing System for XSAM-N-4,  
Guided Missile Dove; Testing of**

**Project No.: NPG-Re2b-34-1-52  
Copy No.: 21  
No. of Pages: 9**

**Date:**

**MAR 20 1952**

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## IMPACT RECORD

U. S. NAVAL PROVING GROUND  
DAHLGREN, VIRGINIAIMPACT NO. 39028IMPACT DATE 10 MAR 1951NPG TEST NO CORE 1001OBJECT SENSITIVITY TEST OF XB-44A FUZE IN 25LB.G.P. BOMB WITH SMOKE PUFF LOADINGReference: NPG Wt. Impact No. 933 dated  
Reference: BuOrd ltr. NP9(R226-2) FLY dated 4 APR. 1949  
Task Assignment No. NPG-R226-34-1-52 dated 4 AUG. 1951

## PLATE TARGET

Gage 0.50 Class STS  
Maker CARNEGIE  
No.            Group             
Dimensions           OBLIQUITY 0°PENETRATION COMPLETEThickness at impact           No. of impact on plate           Dist. from nearest impact           Dist. from near edges            and           Impact area           Spall: Front            Back           Dish            Spur           Cracks           Punching (thrown) (started)           Back button (thrown) (started)           Bulge           Through opening           

## G. P. Bomb ROCKET

HEAD: Cal.            Type G.P. BombMark            Mod            No.            Wt. 258.95Maker DALLot No.           Filler: Type VERTM. Wt.           Fuzes + 1.95 SMOKE PUFFXB-44A FUZE #117Boosters           Wt. of head (as fired) 258.95MOTOR: Cal. 5" Mk. 2 Mod 3Motor temp. 90° Wt. 98.60COMPLETE ROUND: Mark            Mod           Wt. (as fired) 337.55Wt. (burned)           OTHER INFORMATION MOTORS (3)GRAIN: MK. 18-0BLN: RMDA-230-H45LAUNCHER 1A50 Rocket Launcher

## ROCKET PERFORMANCE

Flight            Velocity, f/s: MEAN 888 Residual           Fuze functioning IN SMOKEExplosive action (High Order) (Low Order) (None)           Distance of burst behind plate           Condition of recovered round           Head was in (EFFECTIVE) (INEFFECTIVE) condition.           REMARKS:           Photo No.           Signed F. W. KasdorfF. W. KASDORF, LtC.R.O. E76 6-5-12Confidential  
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APPENDIX A

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IMPACT RECORD

U. S. NAVAL PROVING GROUND  
DAHLGREN, VIRGINIA

IMPACT NO. 39991

IMPACT DATE 24 May 1951

NPG TEST NO. C10E 10622

OBJECT LAUNCHER SENSITIVITY TEST OF XR-44A FUSE IN TEST  
G.P. BOMB INERT LOADED EXCEPT FOR B.M. SMOKE PUFF  
Reference: NPG Report No. 933 dated \_\_\_\_\_  
Reference: BuOrd ltr. NP9(R-26-286-2)FLU dated 4 APR 1949  
Task Assignment No. NPG-R-26-34-1-52 dated 4 AUG 1951

PLATE TARGET

Gage 0.50 Class STS  
Maker \_\_\_\_\_  
No. \_\_\_\_\_ Group \_\_\_\_\_  
Dimensions \_\_\_\_\_

OBLIQUITY \_\_\_\_\_

PENETRATION

Thickness at impact \_\_\_\_\_  
No. of impact on plate \_\_\_\_\_  
Dist. from nearest impact \_\_\_\_\_  
Dist. from near edges \_\_\_\_\_ and \_\_\_\_\_  
Impact area \_\_\_\_\_  
Spall: Front \_\_\_\_\_ Back \_\_\_\_\_  
Dish \_\_\_\_\_ Spur \_\_\_\_\_  
Cracks \_\_\_\_\_  
Punching (thrown) (started) \_\_\_\_\_  
Back Button (thrown) (started) \_\_\_\_\_  
Bulge \_\_\_\_\_  
Through opening \_\_\_\_\_

G.P. BOMB

ROCKET

HEAD: Cal. \_\_\_\_\_ Type G.P. BOMB  
Mark \_\_\_\_\_ Mod \_\_\_\_\_ No. \_\_\_\_\_ Wt. 256.95  
Maker NOL  
Lot No. \_\_\_\_\_  
Filler: Type XXX  
Fuzes XR-44A NO. 113  
Boosters \_\_\_\_\_  
Wt. of head (as fired) 356.95

MOTOR: Cal. 5 Mk. 2 Mod 3  
Motor temp. 90° Wt. 78.20  
COMPLETE ROUND: Mark \_\_\_\_\_ Mod \_\_\_\_\_  
Wt. (as fired) 335.15  
Wt. (burned) \_\_\_\_\_

OTHER INFORMATION NOTES (3)  
GRIN: MK 12.0  
ALN: Rm 20, 830-H-15  
LAUNCHER 1050 ROCKET LAUNCHER

ROCKET PERFORMANCE

Flight \_\_\_\_\_ Velocity, f/s: MEAN Striking 443 Residual \_\_\_\_\_  
Fuze functioning IN SANDPILE  
Explosive action (High Order) (Low Order) (None) \_\_\_\_\_  
Distance of burst behind plate \_\_\_\_\_  
Condition of recovered round \_\_\_\_\_  
Head was in (EFFECTIVE) (~~INSPECTED~~) condition.

REMARKS: \_\_\_\_\_

Photo No. \_\_\_\_\_

Signed F.W. Kador  
F.W. KADOR, Lt  
CDR. ETC. 65-12

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APPENDIX A  
To H. No. 2

IMPACT RECORD

U. S. NAVAL PROVING GROUND  
DAHLGREN, VIRGINIA

IMPACT NO. 38793

IMPACT DATE 5-16-51

NPG TEST NO. \_\_\_\_\_

OBJECT EMULSIFIC TEST OF XB-44A FUSE IN 250# TARGET LAUNCHED

Boards vs 1/2" STS Plate AT 0°

Reference: NPG Report No. 933 dated \_\_\_\_\_

Reference: BuOrd ltr. NP9(Rc26-286-2)FL4 dated 4 APR 1949

Task Assignment No. NPG-Rc26-34-1-52 dated 4 AUG 1951

PLATE TARGET

Gage 1/2" Class STS  
Maker \_\_\_\_\_  
No. \_\_\_\_\_ Group \_\_\_\_\_  
Dimensions \_\_\_\_\_

OBLIQUITY 0°

PENETRATION COMPLETE

Thickness at impact 5  
No. of impact on plate \_\_\_\_\_  
Dist. from nearest impact \_\_\_\_\_  
Dist. from nearest edges \_\_\_\_\_ and \_\_\_\_\_  
Impact area 4  
Spall: Front \_\_\_\_\_ Back \_\_\_\_\_  
Dish \_\_\_\_\_ Spur \_\_\_\_\_  
Cracks 10  
Punching (thrown) (started) \_\_\_\_\_  
Back Button (thrown) (started) \_\_\_\_\_  
Bulge \_\_\_\_\_  
Through opening \_\_\_\_\_

G. P. Bomb ROCKET

HEAD: Cal. \_\_\_\_\_ Type G. P. Bomb  
Mark \_\_\_\_\_ Mod \_\_\_\_\_ No. \_\_\_\_\_ Wt. 258 lbs

Maker NOL

Lot No. \_\_\_\_\_

Filler: Type VERMICULITE Wt. \_\_\_\_\_

Fuzes 15 SACKS OFF

XB-44A No. 119

Boosters \_\_\_\_\_

Wt. of head (as fired) 258 lbs

MOTOR: Cal. 5" Mk. 2 Mod 3  
Motor temp. 70° Wt. 78.30#

COMPLETE ROUND: Mark \_\_\_\_\_ Mod \_\_\_\_\_  
Wt. (as fired) 337.25#  
Wt. (burned) \_\_\_\_\_

OTHER INFORMATION MOTORS (3)  
GRAIN: MK 18-0  
AN: RMDA-230-A-45  
LAUNCHER 1050' ROCKET LAUNCHER

ROCKET PERFORMANCE

Flight \_\_\_\_\_ Velocity, f/s: MEAN 859 Residual \_\_\_\_\_  
Fuse functioning NONE  
Explosive action (High Order) (Low Order) (None) \_\_\_\_\_  
Distance of burst behind plate \_\_\_\_\_  
Condition of recovered round \_\_\_\_\_  
Head was in (EFFECTIVE) (~~INEFFECTIVE~~) condition.

REMARKS: \_\_\_\_\_

Photo No. \_\_\_\_\_

Signed F. W. Kasdorf  
F. W. KASDORF  
CAR. ENG. GS-12

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Page No. 3

## IMPACT RECORD

U. S. NAVAL PROVING GROUND  
DAHLOREN, VIRGINIAIMPACT NO. 38994IMPACT DATE 5-16-51

NPG TEST NO. \_\_\_\_\_

OBJECT BAUSTIC TEST OF YB-44A FUZE IN 250# THERT  
LOADED BOMBS VS 1/2" STS PLATE AT 0° ORLReference: NPG REP. Report No. 933 dated \_\_\_\_\_Reference: BuOrd ltr. NP9 (Re 26-286-2) FLY dated 4 APR. 1949Task Assignment No. NPG-Re 26-34-1-52 dated 4 AUG. 1951

## PLATE TARGET

G. P. Bomb ROCKET

Gage 1/2" Class STS

Maker \_\_\_\_\_

No. \_\_\_\_\_ Group \_\_\_\_\_

Dimensions \_\_\_\_\_

OBLIQUITY 0°PENETRATION COMPLETE

Thickness at impact \_\_\_\_\_

No. of impact on plate \_\_\_\_\_

Dist. from nearest impact \_\_\_\_\_

Dist. from near edges \_\_\_\_\_ and \_\_\_\_\_

Impact area \_\_\_\_\_

Spall: FRONT MEASUREMENTSDisplacement MEASUREMENTS Spur \_\_\_\_\_

Cracks \_\_\_\_\_

Punching (thrown) (started) \_\_\_\_\_

Back Button (thrown) (started) \_\_\_\_\_

Bulge \_\_\_\_\_

Through opening \_\_\_\_\_

HEAD: Cal. \_\_\_\_\_ Type G. P. BombMark \_\_\_\_\_ Mod \_\_\_\_\_ No. \_\_\_\_\_ Wt. 261.95#Maker NOL

Lot No. \_\_\_\_\_

Filler: Type VERMICULATEFuzes 4.95 SMOKE PUFFYB-44A No. 120

Boosters \_\_\_\_\_

Wt. of head (as fired) 261.95#MOTOR: Cal. 5" Mk. 2 Mod 3Motor temp. 70° Wt. 79.40#

COMPLETE ROUND: Mark \_\_\_\_\_ Mod \_\_\_\_\_

Wt. (as fired) 341.35#

Wt. (burned) \_\_\_\_\_

OTHER INFORMATION PICTURES (3)GRAIN: MK 18-2ALN: KMDA-230-H-45LAUNCHER LOS0 ROCKET LAUNCHER

## ROCKET PERFORMANCE

Flight \_\_\_\_\_ Velocity, f/s: MEAN Striking 903 Residual \_\_\_\_\_Fuze functioning NONE

Explosive action (High Order) (Low Order) (None) \_\_\_\_\_

Distance of burst behind plate \_\_\_\_\_

Condition of recovered round \_\_\_\_\_

Head was in (EFFECTIVE) (~~INEFFECTIVE~~) condition.

REMARKS: \_\_\_\_\_

Photo No. \_\_\_\_\_

Signed F. W. KadorfF. W. KADORFORD ENG GS-12Confidential  
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IMPACT RECORD

U. S. NAVAL PROVING GROUND  
DAHLGREN, VIRGINIA

IMPACT NO. 39020

IMPACT DATE 21 MAY 1951

NPG TEST NO. CODE 10687

OBJECT LAUNCHER SENSITIVITY TEST OF XB-44 FUZE

IN 250 LB. G.P. BOMB

Reference: NPG REP. 74.933 dated 4 APR 1947  
Reference: BuOrd ltr. NPG-21-286-2) FL4 dated 4 APR 1947  
Task Assignment No. NPG-21-286-2) FL4 dated 4 APR 1947

PLATE TARGET

G.P. BOMB

ROCKET

Gage 1.50 Class STS  
Maker CARNEGIE  
No.          Group           
Dimensions         

OBLIQUITY 0°

PENETRATION COMPLETE  
Thickness at impact           
No. of impact on plate           
Dist. from nearest impact           
Dist. from nearest edges          and           
Impact area           
Spall: Front Back  
Dish          Spur           
Cracks           
Punching (thrown) (started)           
Back Button (thrown) (started)           
Bulge           
Through opening         

HEAD: Cal.          Type G.P. Bomb  
Mark ANM57 Mod A1 No.          Wt. 258.0\*  
Maker           
Lot No.           
Filler: Type INERT Wt.           
Fuzes         

XB-44 FUZE #121  
Boosters           
Wt. of head (as fired) 258.0\*

MOTOR: Cal. 5" Mk. 2 Mod 3  
Motor temp. 90° Wt. 79.10\*

COMPLETE ROUND: Mark          Mod           
Wt. (as fired) 339.16\*  
Wt. (burned)         

OTHER INFORMATION MOTORS (3)  
ALN: R7710A-230-H.45  
GRAIN: MK 18-0  
LAUNCHER 1050' ROCKET LAUNCHER

ROCKET PERFORMANCE

Flight          Velocity, f/s: MEAN 643 Residual           
Fuze functioning ON SECONDARY IMPACT - HIT HEAVY WEDGE IN BUTT  
Explosive action (High Order) (Low Order) (None)  
Distance of burst behind plate           
Condition of recovered round           
Head was in (EFFECTIVE) (INEFFECTIVE) condition.

REMARKS:         

Photo No.          Signed F.W. KASDORF, Lt.  
ORO. ETC. ES-12

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IMPACT RECORD

U. S. NAVAL PROVING GROUND  
DAHLGREN, VIRGINIA

IMPACT NO. 39021

IMPACT DATE 21 MAY 1951

NPG TEST NO. CODE 10687

OBJECT LAUNCHER SENSITIVITY TEST OF XB-44 FUZE

IN 250 LB. G.P. Bomb

Reference: NPG Report No. 933 dated 4 APR 1951  
Reference: BuOrd ltr. NP9(Re 26-284-2)FLU dated 4 APR 1951  
Task Assignment No. NPG-Re 26-34-1-52 dated 4 AUG 1951

PLATE TARGET

G.P. Bomb ROCKET

Gage C.50 Class ST3  
Maker CARNEGIE  
No. - Group -  
Dimensions -

OBLIQUITY 0°

PENETRATION COMPLETE  
Thickness at impact -  
No. of impact on plate -  
Dist. from nearest impact -  
Dist. from near edge 5 and -  
Impact area -  
Spall: Front COMPLETE Back -  
Dish COMPLETE Spur -  
Cracks COMPLETE  
Punching (thrown) (started) -  
Back Button (thrown) (started) -  
Bulge -  
Through opening -

HEAD: Cal. - Type G.P. Bomb  
Mark ANM57 Mod 91 No. - Wt. 251.00 #  
Maker -  
Lot No. -  
Filler: Type INERT Wt. -  
Fuzes XB-44 FUZE #122  
Boosters -  
Wt. of head (as fired) 251.00 #

MOTOR: Cal. 5" Mk. 2 Mod 2  
Motor temp. 90° Wt. 79.55 #  
COMPLETE ROUND: Mark - Mod -  
Wt. (as fired) 390.55 #  
Wt. (burned) -

OTHER INFORMATION MOTORS (3)  
ALN: RMDA-230-H-45  
GRAIN: MK 18-0  
LAUNCHER 1050' ROCKET LAUNCHER

ROCKET PERFORMANCE

Flight MEAN Velocity, f/s: 893 Residual -  
Fuze functioning 250 FT BEHIND TARGET  
Explosive action (High Order) (Low Order) (None)  
Distance of burst behind plate -  
Condition of recovered round -  
Head was in (EFFECTIVE) (INEFFECTIVE) condition.

REMARKS: -

Photo No. - Signed F.W. KASDORF  
F.W. KASDORF, Lt  
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IMPACT RECORD

U. S. NAVAL PROVING GROUND  
DAHLGREN, VIRGINIA

IMPACT NO. 39022  
IMPACT DATE 22 May 1951  
NPG TEST NO. CODE 10687

OBJECT LAUNCHER SENSITIVITY TEST OF XB-44 FUZE  
IN 250 LB. G.P. BOMB INERT LOADED  
Reference: NPG Report No. 933 dated           
Reference: BuOrd ltr. NP9(Rc26-22L-2)FL4 dated 4 APR 1949  
Task Assignment No. NP9-Rc26-34-1-52 dated 4 AUG 1951

PLATE TARGET

Gage 0.50 Class STS  
Maker CARNEGIE  
No.          Group           
Dimensions         

OBLIQUITY 0°

PENETRATION COMPLETE  
Thickness at impact           
No. of impact on plate           
Dist. from nearest impact           
Dist. from near edges          and           
Impact area           
Spall: Front          Back           
Dish          Spur           
Cracks           
Punching (thrown) (started)           
Back Button (thrown) (started)           
Bulge           
Through opening         

G.P. BOMB ROCKET

HEAD: Cal.          Type G.P. Bomb  
Mark Ann 57 Mod 91 No.          Wt. 255.0\*  
Maker           
Lot No.           
Filler: Type INERT Wt.           
Fuzes XB-44 FUZE # 123  
Boosters           
Wt. of head (as fired) 255.0\*

MOTOR: Cal. 5" Mk. 2 Mod 3  
Motor temp. 90° Wt. 79.85\*  
COMPLETE ROUND: Mark          Mod           
Wt. (as fired) 334.85\*  
Wt. (burned)         

OTHER INFORMATION  
ALT: PRICE 230-H 45  
GRAIN: MK 18-0  
LAUNCHER 1050' ROCKET LAUNCHER

ROCKET PERFORMANCE

Flight          Velocity, f/s: Striking 916 Residual           
Fuze functioning 245 FT. BEHIND TARGET  
Explosive action (High Order) (Low Order) (None)           
Distance of burst behind plate           
Condition of recovered round           
Head was in (EFFECTIVE) (~~INEFFECTIVE~~) condition.

REMARKS:         

Photo No. NP9-47019

Signed F.W. KASDORF  
F.W. KASDORF, Lt  
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## IMPACT RECORD

U. S. NAVAL PROVING GROUND  
DAHLGREN, VIRGINIAIMPACT NO. 39047IMPACT DATE 29 MAY 1951NPG TEST NO. CODE 16690

OBJECT SEPARATION TEST OF ROCKET CARRIAGE AND  
250 LB. G.P. INERT LOADED MOTOR USING 3-5" MOTORS AND  
 Reference: NPG ITR ONE 3.25" RETRO MOTOR dated 11 May 1951  
 Reference: NOTE ltr. NIP/NOL VI-1(234) WASH DC dated 11 May 1951  
 Task Assignment No. NPG-25-17026-20 dated 15 Feb 1950

## PLATE TARGET

Gage 0.959 Class STS  
 Maker LUKENS  
 No. 21 Group STS-6-2  
 Dimensions 85" X 348"

OBLIQUITY 0°PENETRATION COMPLETE

Thickness at impact \_\_\_\_\_  
 No. of impact on plate \_\_\_\_\_  
 Dist. from nearest impact \_\_\_\_\_  
 Dist. from near edges \_\_\_\_\_ and \_\_\_\_\_  
 Impact area \_\_\_\_\_  
 Spall: Front \_\_\_\_\_ Back \_\_\_\_\_  
 Dish \_\_\_\_\_ Spur \_\_\_\_\_  
 Cracks \_\_\_\_\_  
 Punching (thrown) (started) \_\_\_\_\_  
 Back Button (thrown) (started) \_\_\_\_\_  
 Bulge \_\_\_\_\_  
 Through opening \_\_\_\_\_

## ROCKET

GP BOMB  
 HEAD: Cal. \_\_\_\_\_ Type G.P. BOMB  
 Mark ANM57 Mod AI No. \_\_\_\_\_ Wt. \_\_\_\_\_  
 Maker \_\_\_\_\_  
 Lot No. \_\_\_\_\_  
 Filler: Type INERT Wt. \_\_\_\_\_  
 Fuzes NONE

Boosters \_\_\_\_\_  
 Wt. of head (as fired) 36.25

MOTOR: Cal. 5" Mk. 2 Mod 3  
 Motor temp. 90° Wt. 79.05

COMPLETE ROUND: Mark \_\_\_\_\_ Mod \_\_\_\_\_  
 Wt. (as fired) \_\_\_\_\_  
 Wt. (burned) \_\_\_\_\_

OTHER INFORMATION MOTORS (4)  
5.0: ALN: RMDA-230-H45 GRAIN: MK 130  
3.25: ALN: RMDA-400-NECH-45 " MK 130  
LAUNCHER 1050 ROCKET LAUNCHER

## ROCKET PERFORMANCE

Flight \_\_\_\_\_ Velocity, f/s: MEAN Striking 839 Residual \_\_\_\_\_  
 Fuze functioning NO FUZE IN THIS BOMB  
 Explosive action (High Order) (Low Order) (None) \_\_\_\_\_  
 Distance of burst behind plate \_\_\_\_\_  
 Condition of recovered round \_\_\_\_\_  
 Head was in (EFFECTIVE) (INEFFECTIVE) condition.

REMARKS: SOME SEPARATION - BOMB HAD GOOD FLIGHT, METALS  
IN VERTICAL POSITION AT TARGET DUE TO OFF CENTER RETRO MOTOR

Photo No. NP9-47020

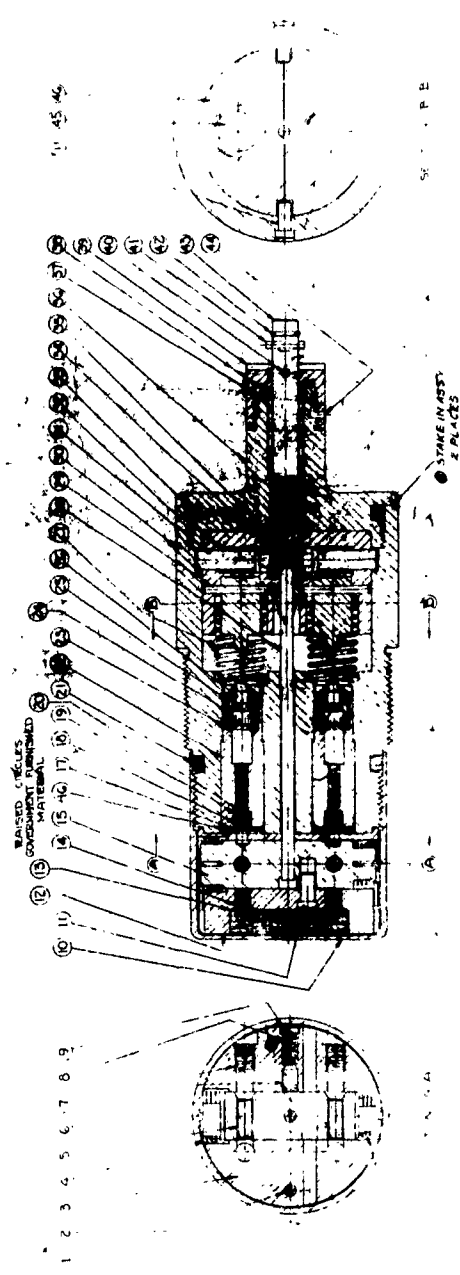
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2	1-100-004	BASE PLATE	1	1-100-005	BASE PLATE	1	1-100-006	BASE PLATE	1
3	1-100-007	BASE PLATE	1	1-100-008	BASE PLATE	1	1-100-009	BASE PLATE	1
4	1-100-010	BASE PLATE	1	1-100-011	BASE PLATE	1	1-100-012	BASE PLATE	1
5	1-100-013	BASE PLATE	1	1-100-014	BASE PLATE	1	1-100-015	BASE PLATE	1
6	1-100-016	BASE PLATE	1	1-100-017	BASE PLATE	1	1-100-018	BASE PLATE	1
7	1-100-019	BASE PLATE	1	1-100-020	BASE PLATE	1	1-100-021	BASE PLATE	1
8	1-100-022	BASE PLATE	1	1-100-023	BASE PLATE	1	1-100-024	BASE PLATE	1
9	1-100-025	BASE PLATE	1	1-100-026	BASE PLATE	1	1-100-027	BASE PLATE	1
10	1-100-028	BASE PLATE	1	1-100-029	BASE PLATE	1	1-100-030	BASE PLATE	1
11	1-100-031	BASE PLATE	1	1-100-032	BASE PLATE	1	1-100-033	BASE PLATE	1
12	1-100-034	BASE PLATE	1	1-100-035	BASE PLATE	1	1-100-036	BASE PLATE	1
13	1-100-037	BASE PLATE	1	1-100-038	BASE PLATE	1	1-100-039	BASE PLATE	1
14	1-100-040	BASE PLATE	1	1-100-041	BASE PLATE	1	1-100-042	BASE PLATE	1
15	1-100-043	BASE PLATE	1	1-100-044	BASE PLATE	1	1-100-045	BASE PLATE	1
16	1-100-046	BASE PLATE	1	1-100-047	BASE PLATE	1	1-100-048	BASE PLATE	1
17	1-100-049	BASE PLATE	1	1-100-050	BASE PLATE	1	1-100-051	BASE PLATE	1
18	1-100-052	BASE PLATE	1	1-100-053	BASE PLATE	1	1-100-054	BASE PLATE	1
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38	1-100-112	BASE PLATE	1	1-100-113	BASE PLATE	1	1-100-114	BASE PLATE	1
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89	1-100-265	BASE PLATE	1	1-100-266	BASE PLATE	1	1-100-267	BASE PLATE	1
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92	1-100-274	BASE PLATE	1	1-100-275	BASE PLATE	1	1-100-276	BASE PLATE	1
93	1-100-277	BASE PLATE	1	1-100-278	BASE PLATE	1	1-100-279	BASE PLATE	1
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96	1-100-286	BASE PLATE	1	1-100-287	BASE PLATE	1	1-100-288	BASE PLATE	1
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98	1-100-292	BASE PLATE	1	1-100-293	BASE PLATE	1	1-100-294	BASE PLATE	1
99	1-100-295	BASE PLATE	1	1-100-296	BASE PLATE	1	1-100-297	BASE PLATE	1
100	1-100-298	BASE PLATE	1	1-100-299	BASE PLATE	1	1-100-300	BASE PLATE	1



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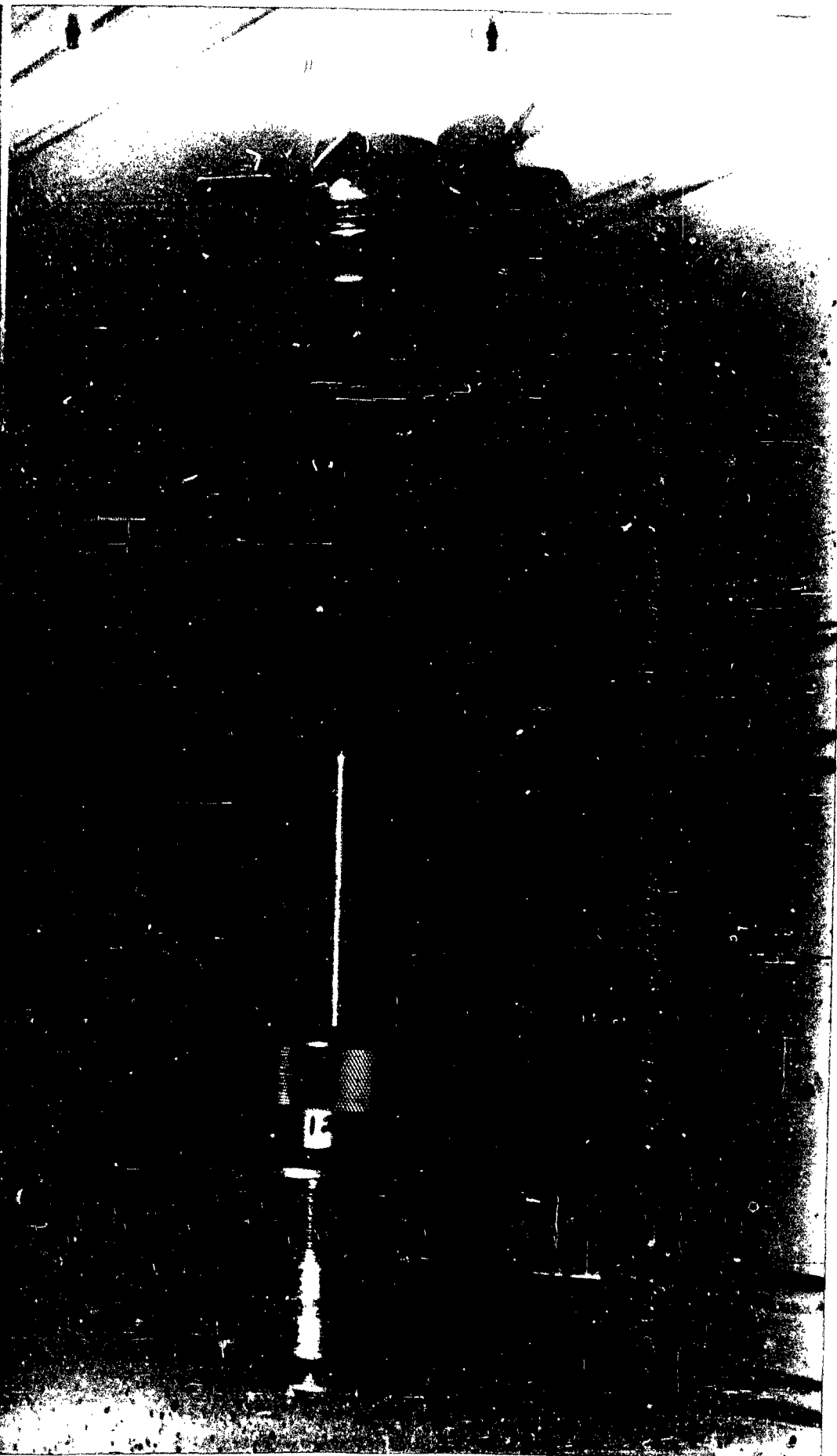
Fig. 1  
NTP-46987

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FUSE ASSEMBLY XB 46 A	
21 B	
DIS-005	
SECURITY INFORMATION	

FIG. 1

44-38861-1000



NP9-46089

Test vehicle for B-44A fuze. Fired from NPG 500 ft. Launcher in 250# G. P. inert loaded bomb. Fuze functioning indicated by cross-axial smoke puff in tail of bomb. Compressed air used to prearm fuze. Three 5"O rocket motors Mk 2 used for propulsion.

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Figure 3



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 RP9-47019  
 Functioning test of M-44A fuze. Fired from RPG 500 ft. launcher with 15 ft. 5"O VAR motors for propulsion vs 1/2" STE plate at 0° obliquity 15 feet from muzzle of launcher.

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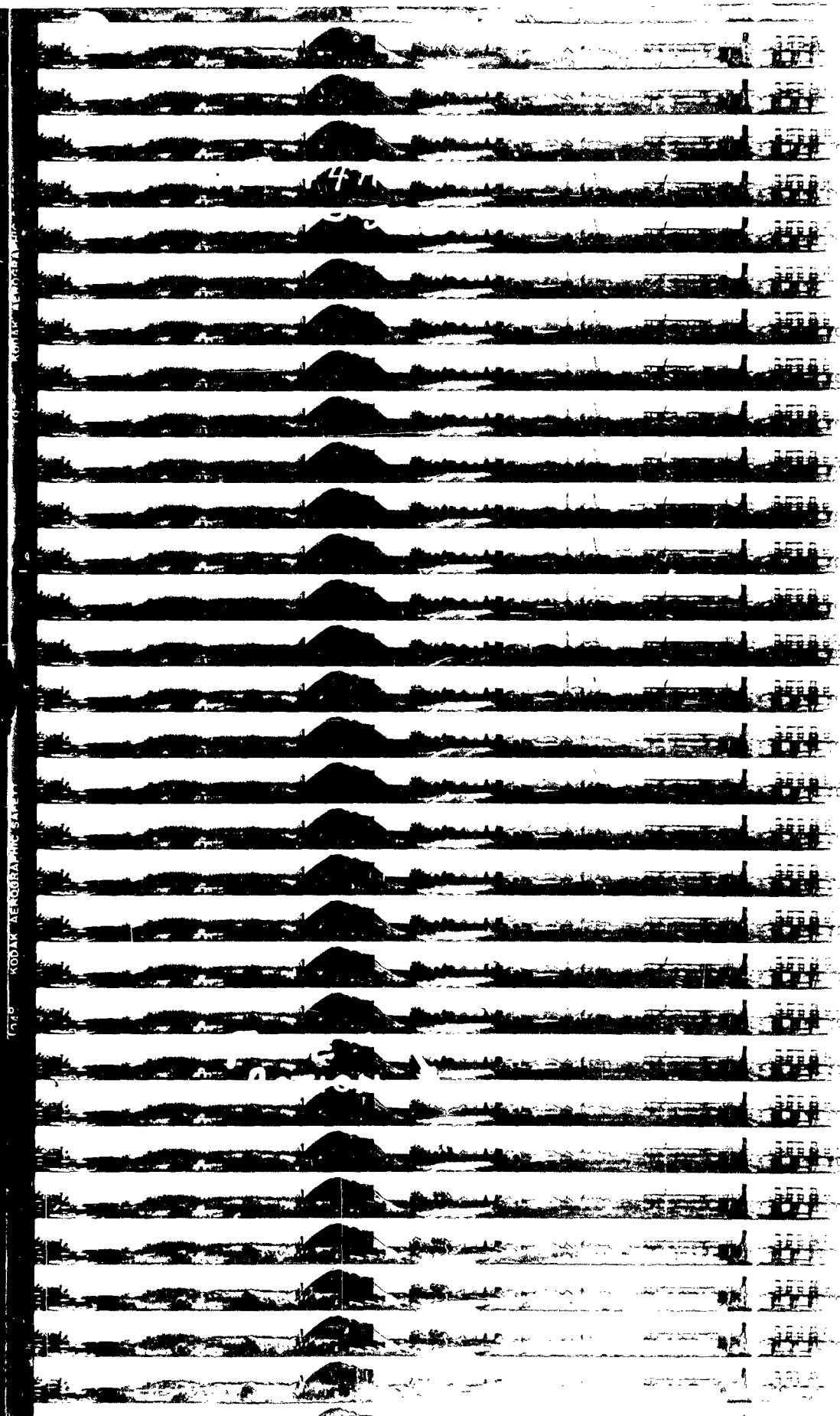


Figure 4

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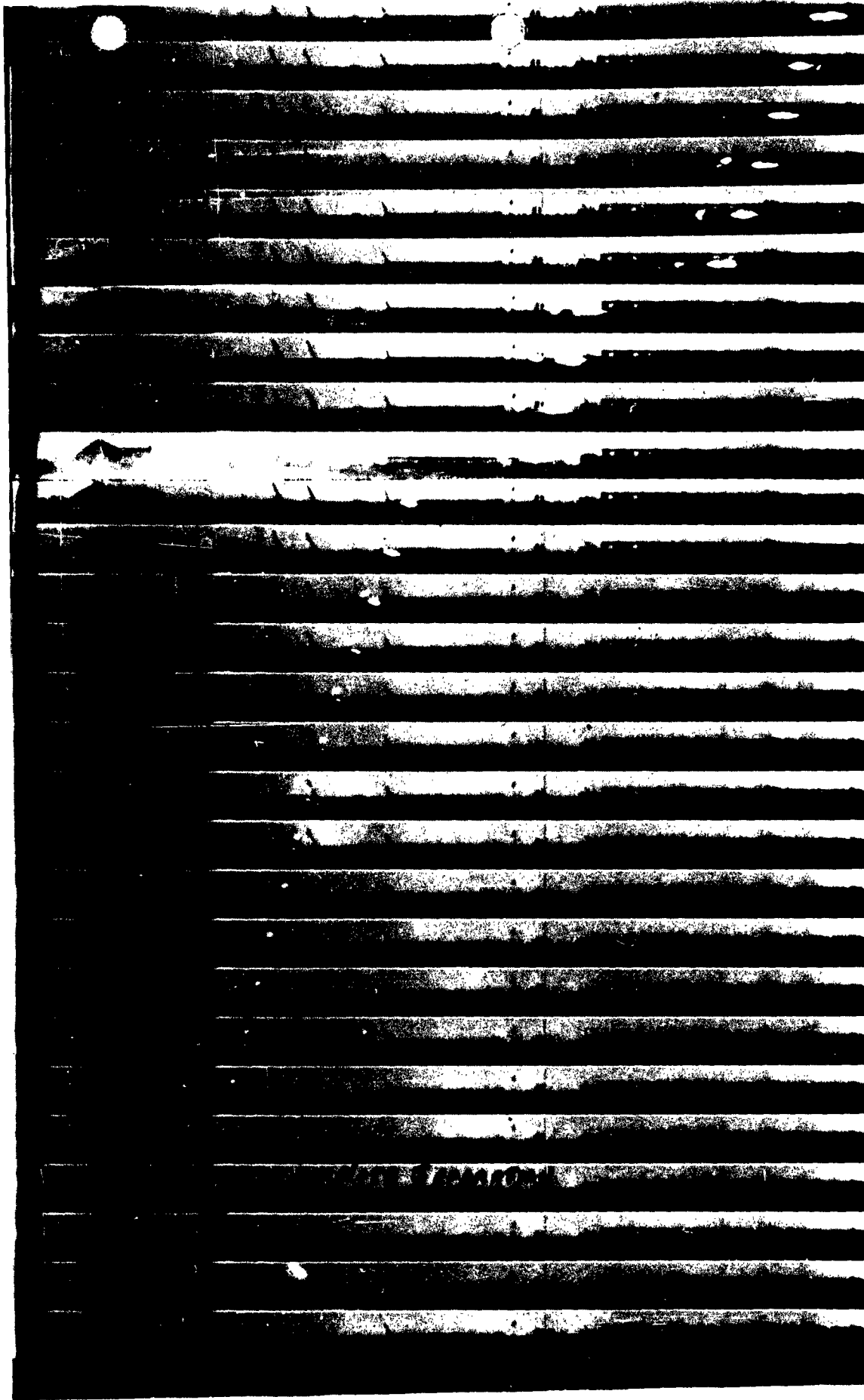
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Figure 5



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NPG REPORT NO. 933

Fuzing System for XSAM-N-4, Guided Missile Dove; Testing of  
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Fuzing System for XSAM-N-4, Guided Missile Dove; Testing of  
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